



DEPARTMENT OF THE NAVY  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
2000 NAVY PENTAGON  
WASHINGTON DC 20350-2000

OPNAVINST 2400.20G  
N2N6  
7 Jan 2021

OPNAV INSTRUCTION 2400.20G

From: Chief of Naval Operations

Subj: ELECTROMAGNETIC ENVIRONMENTAL EFFECTS AND SPECTRUM  
SUPPORTABILITY POLICY AND MANAGEMENT

Ref: (a) DoD Instruction 4650.01 of 9 January 2009  
(b) DoD Instruction 3222.03 of 25 August 2014  
(c) SECNAVINST 2400.1B  
(d) SECNAVINST 2400.2A

1. Purpose. This instruction establishes Navy Electromagnetic Environmental Effects and spectrum supportability policy ensuring reliable, safe, and mission capable operations of all electrical and Communications-Electronics equipment, systems and subsystems, devices, ordnance, and fuels within their intended electromagnetic operational environment (EMOE), including effects on personnel. Electromagnetic Environmental Effects and spectrum supportability considerations apply to all platforms, systems, subsystems, facilities, weapons, electric or electronic equipment, networks, sensors, fuels, and ordnance, (hereinafter referred to as equipment, systems and platforms) developed, procured, acquired, operated, and maintained by the Navy including Commercial Items and Non-Developmental Items. Since this instruction has been widely revised it should be read in its entirety. Summary of changes are reflected in subparagraphs 1a through 1c.

a. Replaces the "Spectrum Supportability Determination" requirement with the Spectrum Supportability Risk Assessment (SSRA), as defined within reference (a).

b. Adds explicit responsibilities for Commander, Naval Information Warfare Systems Command (COMNAVWARSYSCOM), and Commander, Naval Facilities Engineering Command (COMNAVFACENGCOM).

c. The previous OPNAVINST 2400.20F, contained five enclosures. Detailed procedures in enclosures (2), (3) and (5) are codified in NTP-6F. The Department of Defense (DoD) Dictionary of Military and Associated Terms replaced the list of electromagnetic environmental effects and spectrum definitions previously contained in enclosure (1) and enclosure (4).

2. Cancellation. OPNAVINST 2400.20F

3. Scope and Applicability. This instruction applies to all equipment (commercial off-the-shelf, military off-the-shelf) and to all United States Navy (USN) commands. This instruction does not apply to United States Coast Guard or foreign military sales, or development efforts where equipment will be integrated on United States Coast Guard or foreign military sales platforms. This instruction is applicable to any United States Coast Guard equipment when installed on USN platforms. This instruction applies to the United States Marine Corps forces when embarked on Navy platforms, otherwise Marine Corps Order 2400.2A applies.

#### 4. Background

a. This instruction is published in support of spectrum dependent systems (SDS), subsystems, equipment, and platforms that transmit and receive electromagnetic radiation, and specific procedures for the submission of DoD forms to obtain equipment spectrum certification and the authority to operate (i.e., frequency assignments).

b. Commonly-used terms pertaining to electromagnetic environmental effects and spectrum supportability processes are defined in DoD Dictionary of Military and Associated Terms.

c. Within this instruction, the term “Systems Command” (SYSCOM) refers to Commander Naval Sea Systems Command (COMNAVSEASYSKOM), COMNAVWARSYSKOM, Commander Naval Air Systems Command (COMNAVAIRSYSKOM) and NAVFACENGCOM. The SYSCOM responsibilities and accountability are defined in SECNAVINST 5400.15C, and apply to research and development, acquisition, associated life-cycle management, and logistics within the USN.

#### 5. Policy

a. Electromagnetic Environmental Effects Control and Spectrum Supportability: Electromagnetic environmental effects control and spectrum supportability will be considered a fundamental design requirement at the total platform systems level. Electromagnetic environmental effects control will be implemented per enclosure (4) of reference (b), which establishes the requirements and procedures for implementing the DoD Electromagnetic Environmental Effects Program by the Navy program managers (PM) and material developers. Electromagnetic environmental effects and spectrum supportability requirements will be:

- (1) incorporated in a cost-effective manner;
- (2) designed in from inception; and
- (3) maintained through the equipment, systems, and platform’s life cycle.

b. Overlap of Requirements for Electromagnetic Environmental Effects and Spectrum Supportability: As depicted in figure 1, electromagnetic environmental effects and spectrum

supportability requirements overlap. Together, they ensure that equipment, systems, and platforms meet their mission requirements in the intended EMOE.

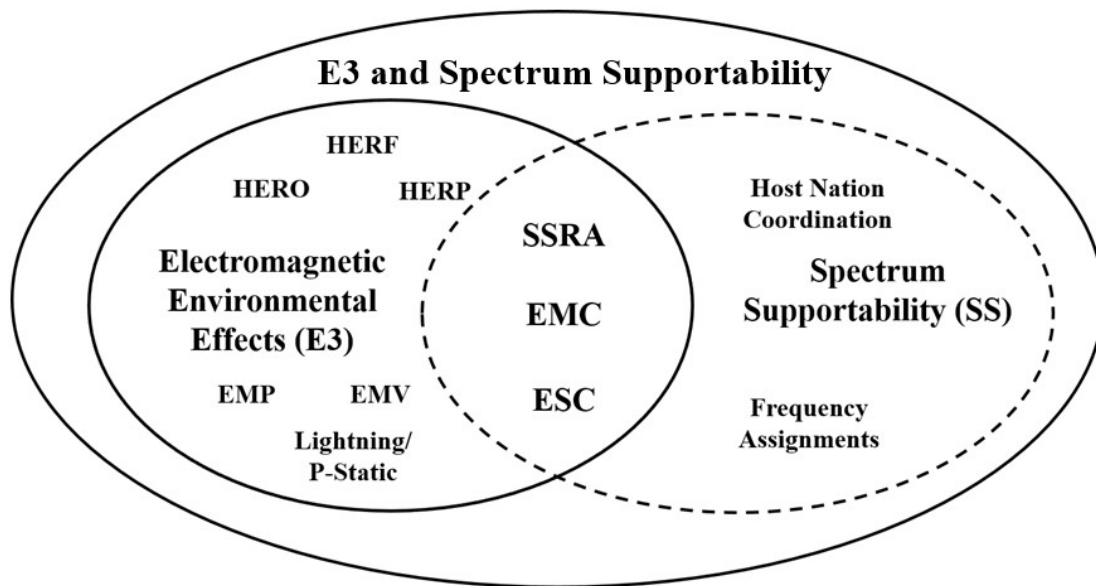


Figure 1. Electromagnetic Environmental Effects and Spectrum Supportability Relationship

Acronyms/Abbreviations	
EMC	electromagnetic compatibility
EMP	electromagnetic pulse
EMV	electromagnetic vulnerability
ESC	equipment spectrum certification
HERF	hazards of electromagnetic radiation to fuel
HERO	hazards of electromagnetic radiation to ordnance
HERP	hazards of electromagnetic radiation to personnel
P-Static	precipitation static
SSRA	spectrum supportability risk assessment

(1) Program managers for Acquisition Categories I through IV programs will ensure their assigned programs comply with applicable statutory and regulatory requirements summarized in enclosure (3), table E3T2 of SECNAVINST 5000.2F. PMs will adhere to table E3T2 at milestones A, B, and C and provide a DD Form 1494 Frequency Allocation Application, a statutory requirement and SSRA/Determination, a Regulatory requirement. Systems engineering guidance for Navy acquisition programs can be found in enclosure (4), paragraph 23 (Spectrum Supportability) of SECNAVINST 5000.2F and table 2 of enclosure (1), section 19 of enclosure (3) of DoD Instruction 5000.02.

(2) Per references (b) and (c), no spectrum-dependent, "off-the-shelf," or other non-developmental system, will be purchased or procured without a spectrum supportability assessment.

c. Common Electromagnetic Environmental Effects and Spectrum Supportability Requirements

(1) Net-ready key performance parameter, per Chairman of the Joint Chiefs of Staff Instruction 6212.02F, will be applicable to all systems and equipment that use the electromagnetic spectrum (EMS).

(2) Each command, activity, project or program office, laboratory, or facility is accountable for the implementation and enforcement of electromagnetic environmental effects and spectrum supportability requirements, in addition to program considerations in the achievement of electromagnetic compatibility (EMC) within its respective area of responsibility per reference (c).

(3) Each command, doctrine, tactic, technique, and procedure will consider electromagnetic environmental effects and spectrum supportability in the operational employment of equipment, systems, and platforms.

(4) Electromagnetic environmental effects and spectrum supportability tenets will be included in modeling, simulation, and war-gaming to ensure awareness of the total EMOE in the evolution of new doctrine, organization, training, materiel, leadership and education, personnel, and facilities capabilities.

(5) Per reference (b), Navy platforms, systems, subsystems, and equipment will meet their operational performance requirements without experiencing unacceptable performance degradation from Electromagnetic Environmental Effects or causing unacceptable performance degradation to other systems.

(6) All Electromagnetic Environmental Effects/Spectrum analytical tools and databases will comply with DoD Instruction 8320.05.

(7) The use of Part 15 "unlicensed" devices in Navy applications is discouraged, as they must cease operation if they interfere with licensed devices and must accept any interference received, including interference causing undesirable impact. Those choosing to employ unlicensed devices must first comply with all spectrum supportability requirements, including providing a SSRA and obtaining equipment certification and frequency assignment.

6. Responsibilities

a. Deputy Chief of Naval Operations for Information Warfare (CNO N2N6) will:

(1) plan, program and budget resources to COMNAVSEASYSCOM to support the Shipboard Electromagnetic Compatibility Improvement Program to provide responsive capabilities for the prevention, detection, correction, and reporting of operationally degrading electromagnetic interference (EMI) problems experienced by the operating forces in the fleet, per paragraph 5b of reference (c) and paragraph 3 of reference (b). Coordinate resources from the Director, Expeditionary Warfare (OPNAV N95); Director, Surface Warfare (OPNAV N96); Director, Undersea Warfare (OPNAV N97); and Director, Air Warfare (OPNAV N98) to provide electromagnetic environmental effects and spectrum supportability support for their respective platforms;

(2) plan, program and budget resources to COMNAVSEASYSCOM to support the Navy's Nuclear Electromagnetic Pulse (EMP) Survivability Program. The Nuclear EMP Survivability Program will support and assess the EMP survivability of all mission-critical systems and develop a hardness maintenance and hardness surveillance program, per subparagraphs 5f through 5h of reference (d);

(3) provide requirements and guidance for the development of SSRAs for all SDS per paragraph 8a. of SECNAVINST 5000.2F, and paragraph 4i of reference (c);

(4) plan, program and budget resources to Naval Information Forces (COMNAVIFOR) to support the Navy and Marine Corps Spectrum Center (NMSC), per paragraph 4f of reference (c). Provide resources to pay the annual National Telecommunications and Information Administration reimbursement of spectrum fees, per Public Law 106-553;

(5) provide Navy representation to joint, national, and international meetings to assess impact on Navy operations, per paragraph 4h of reference (c);

(6) provide Navy representation at the DoD Electromagnetic Environmental Effects Integrated Product Team (IPT) to review, analyze, and resolve Electromagnetic Environmental Effects warfighting deficiencies, per enclosure (2) (DoD Electromagnetic Environmental Effects IPT Charter), paragraph 4g of reference (b); and

(7) provide Navy electromagnetic environmental effects and spectrum supportability representation to the Joint Staff's Military Command, Control, Communications, and Computers Executive Board frequency panel, per enclosure (2), paragraph 6d of reference (a) and enclosure (b), paragraph 4 of Chairman of the Joint Chiefs of Staff Instruction 5116.05.

b. Director for Assessments (OPNAV N81) will: Include electromagnetic environmental effects and spectrum supportability requirements and effects in warfighting assessments.

c. Director, Integrated Warfare (OPNAV N9I) will:

(1) ensure that electromagnetic environmental effects and spectrum supportability requirements are reflected in Joint Capabilities Integration and Development System (JCIDS) documentation before being routed through OPNAV and the Joint Requirements Oversight Committee process, per enclosure (8) of SECNAVINST 5000.2F and Manual for the Operation of the JCIDS; and

(2) coordinate with CNO N2N6 to provide guidance to JCIDS and acquisition document developers on required electromagnetic environmental effects and spectrum supportability requirements.

d. Director for Innovation, Technology Requirements, and Test and Evaluation (OPNAV N94) will:

(1) ensure electromagnetic environmental effects and spectrum supportability mission-capability requirements are reflected in development of test and evaluation master plans; and

(2) perform electromagnetic environmental effects and spectrum supportability assessments during developmental test and operational test readiness reviews.

e. COMNAVSEASYS COM, COMNAVAIRSYS COM and COMNAVWARSYS COM will:

(1) designate, train, and resource an electromagnetic environmental effects and spectrum management program lead to support electromagnetic environmental effects and spectrum supportability requirements across cognizant program executive offices (PEOs) and PMs;

(2) designate, train and resource a Electromagnetic Environmental Effects and Spectrum Technical Warrant Holder to ensure that electromagnetic environmental effects and spectrum supportability are planned and incorporated into all command, control, communications, computers, intelligence, surveillance, and reconnaissance and business/information technology systems, developed, procured, acquired, leased, operated, modified or maintained by appropriate systems command throughout their life-cycle;

(a) Support PEO, direct-reporting PMs, and PMs in the development of Electromagnetic Environmental Effects and spectrum supportability documentation, per paragraph 5, herein.

(b) Review and provide concurrence with all DD Form 1494, before submission to NMSC.

(3) provide an engineering capability to evaluate and correct EMI degradation reported by the fleet involving Navy equipment, systems, and platforms;

(4) provide representation at the DON Spectrum Supportability IPT, per enclosure (3), paragraph 3 of reference (c);

(5) ensure that electromagnetic environmental effects and spectrum supportability requirements, herein are integrated into the business processes for ship, platform, and ashore modernization and new system, equipment deployment; and

(6) provide representation at the Electromagnetic Environmental Effects/Spectrum working group per Integrated Product Team Charter for U.S. Navy/U.S. Marine Corps Electromagnetic Environmental Effects and Spectrum Supportability dated 31 August 2016.

f. COMNAVSEASYSKOM will:

(1) per 6a(1), execute Shipboard Electromagnetic Compatibility Improvement Program, perform ship and submarine EMC and Radiation Hazard (RADHAZ) certifications, to ensure ready forces;

(2) maintain the Navy Training Systems Plan, per OPNAVINST 1500.76C, and serve as the Principal Development Agent for training material for Navy schools and courses, in coordination with other SYSCOMS as appropriate;

(3) maintain EMP Survivability Program per reference (d); and

(4) as delegated by CNO N2N6 per reference (c), ensure Navy systems impacted by spectrum reallocation are properly addressed for sharing or loss of spectrum and attain comparable capability, per section 923 of Title 47, U.S. Code and per reference (c).

g. PEO, direct-reporting PMs, and PMs will:

(1) ensure electromagnetic environmental effects and spectrum supportability requirements are incorporated into all programs (i.e., all equipment, systems, and platforms). Per enclosure (3) paragraph 8, table E3T2 of SECNAVINST 5000.2F, develop and submit a DD Form 1494, and SSRA/Determination, at milestone A, B and C, for each SDS, including commercial items and non-developmental items. Obtain approval before assuming contractual obligations for system development and demonstration, production, and deployment per reference (a);

(2) coordinate and resolve electromagnetic environmental effects and spectrum supportability issues with the appropriate SYSCOM and technical warrant holder; and

(3) coordinate with COMNAVSEASYSKOM on shipboard EMC and RADHAZ certification test planning, funding, and execution. Ships, submarines, and shipboard systems

will be required to comply with ship EMC and RADHAZ certification requirements prior to operational use.

h. Fleet Commanders will:

(1) promote electromagnetic environmental effects and spectrum awareness in the fleet. Ensure that equipment, systems, and platform maintenance is performed under published EMI control procedures;

(2) report electromagnetic environmental effects and spectrum problems to the appropriate SYSCOM, per volume VI, chapter 4 of the Joint Fleet Maintenance Manual; and

(3) coordinate with NMSC and regional Navy and Marine Corps Spectrum Offices (NMSCO) to assist with spectrum certifications and frequency assignments, support major fleet unit exercises, and provide assistance as needed for EMS de-confliction with other government agencies.

i. Commanders of Navy Installations, Bases, Tenant Commands, Activities and all Subordinate Commands, in coordination with NAVFACENGCOM will:

(1) designate an Installation Spectrum Manager, to serve as a central point of contact for spectrum supportability, per chapter 4 of NTP-6(F), and paragraphs 4g(1) and 4g(2) of reference (c);

(2) ensure equipment spectrum certifications DD Form 1494 and frequency assignments are obtained prior to submitting cost estimate for SDSs per reference (a);

(3) ensure that provisions for use of specific SDSs by military, non-military, or contractor tenant activities on their installations are specifically addressed in a host-tenant agreement, per paragraph 4g(2) of reference (c);

(4) support coordination of funding and tenant commands within their regional authority. Ensure that RADHAZ surveys are conducted per OPNAVINST 5100.23H; and



(5) ensure that necessary electromagnetic environmental effects and spectrum supportability studies are conducted prior to approval for all requests for installation of commercial telecommunications services equipment on shore installations, per enclosure (3), paragraph 8e of reference (b).

j. COMNAVIFOR will:

(1) publish and maintain a detailed guide for EMS management and operations;

(2) maintain and support NMSC and NMCSOs;

(3) ensure spectrum certifications and frequency assignments for spectrum dependent equipment, systems, and platforms are completed as they are introduced into the fleet and updated throughout the system's life cycle, per enclosure (2), paragraph 4f of reference (c). Support the spectrum reallocation process, by ensuring Navy mission critical receivers are provided spectrum support and are properly registered in the government master file, per reference (c); and

(4) maintain frequency assignment records, and periodically review all frequency assignments (i.e., five-year review) per chapter 8, paragraph 8.2.6 of the National Telecommunications and Information Administration Manual.

k. All Other Organizational Entities within the Navy. Comply with respective SYSCOM and PEO Electromagnetic Environmental Effects and Spectrum Supportability approved procedures and the requirements of this instruction.

7. Records Management

a. Records created as a result of this instruction, regardless of format or media, must be maintained and dispositioned per the records disposition schedules located on the Department of the Navy Assistant for Administration Directives and Records Management Division portal page at <https://portal.secnav.navy.mil/orgs/DUSNM/DONAA/DRM/Records-and-Information-Management/Approved%20Record%20Schedules/Forms/AllItems.aspx>.

b. For questions concerning the management of records related to this instruction or the records disposition schedules please contact the local records manager or the OPNAV Records Management Program (DNS-16).

8. Review and Effective Date. Per OPNAVINST 5215.17A, Director, Warfare Integration (OPNAV N2N6I) will review this instruction annually around the anniversary of its issuance date to ensure applicability, currency, and consistency with Federal, Department of Defense, Secretary of the Navy, and Navy policy and statutory authority using OPNAV 5215/40 Review of Instruction. This instruction will be in effect for 10 years, unless revised or cancelled in the

interim, and will be reissued by the 10-year anniversary date if it is still required, unless it meets one of the exceptions in OPNAVINST 5215.17A, paragraph 9. Otherwise, if the instruction is no longer required, it will be processed for cancellation as soon as the need for cancellation is known following the guidance in OPNAV Manual 5215.1 of May 2016

9. Forms and Information Management Control. DD Form 1494, Application for Equipment Frequency Allocation is available via the 'Forms' tab on the DoD Forms Management Web Site: <https://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd1494.pdf>.



JEFFREY E. TRUSSLER  
Deputy Chief of Naval Operations  
Information Warfare

**Releasability and distribution:**

This instruction is cleared for public release and is available electronically only via Department of the Navy Issuances Web site, <http://www.secnave.navy.mil/doni>.